in the Lake region on the 26th. This disturbance passed to the north of Minnesota, but the centre could not be located after the 26th.

VIII.—Appeared far to the north of the lower lake region on the 24th, and passed directly southeastward to the New England coast during the succeeding twenty-four hours. It was attended by light rains and thunder-storms in New England during the 25th and remained practically stationary over Nova Scotia from the 25th to the 28th without causing any marked disturbance.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.		Duration.	Velocity per hour.	Maximum abnormal changes in pressure in twelve hours, with maximum abnormal changes in temperature and maximum wind velocities in connection therewith.									
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.			Rise.	Station.	Date.	Fall.	Station.	Date.	Miles per hour.	Direction.	Station.	Date
High areas.		°	°	°	°	*Days.*	*Miles.*	*Inch.*			°						
I	*30	54	108	45 / 26	56 / 78	6.0 / 7.0	22 / 20	.42	Swift Current, N. W. T.	*29	27	Chicago, Ill	*31	40	ne.	Fort Buford, N. Dak	*31
II	1	37	126	30	76	10.0	20	.42	Rockliffe, Ont	7	26	Montrose, Colo	3	54	n.	Galveston, Tex	6
III	11	42	128	40	71	10.0	18	.36	Rapid City, S. Dak	13	24	Duluth, Minn	16	60	nw.	Detroit, Mich	17
IV	14	52	77	37	69	2.5	23	.20	Chatham, N. B	15	8	Eastport, Me	16	52	nw.	Hatteras, N. C	15
V	25	43	127	40	104	5.5	14	.38	Calgary, N. W. T	30	24	Santa Fé, N. Mex	25	48	n.	Valentine, Nebr	28
Mean	....	46	113	36	76	6.8	20	.36		....	22		....	51			....
Low areas.								Fall.			Rise.						
I	1	41	112	48	52	7.0	20	.30	Winnipeg, Man	1	17	Marquette, Mich	5	66	sw.	Fort Sully, S. Dak	4
II	8	28	96	44	75	5.0	21	.30	Montreal, Quebec	10	15	Fort Sully, S. Dak	10	39	w.	Harrisburg, Pa	12
III	8	54	112	37	101	2.0	30	.40	Swift Current, N. W. T.	8	22	Swift Current, N. W. T.	8	76	nw.	Fort Assiniboine, Mont.	9
IV	11	47	107	52 / 45	97 / 92	3.5 / 3.0	14 / 15	.26	Concordia, Kans / Qu'Appelle, N. W. T	12 / 11	23	Pueblo, Colo	12	56	w.	do	13
V	16	40	122	53	97	5.0	21	.36	Fort Sully, S. Dak	17	26	Spokane Falls, Wash	15	52	w.	do	21
VI	17	53	67	44	63	1.5	24	.28	Montreal, Quebec	17	14	Father Point, Quebec	16	48	e.	Father Point, Quebec	18
VII	21	39	104	51	99	5.0	9	.34	Fort Custer, Mont	24	19	Denver, Colo	22	70	se.	Yankton, S. Dak	23
VIII	24	50	76	43	60	4.0	12	.22	Halifax, N. S	22	10	Block Island, R. I	25	34	nw.	New York City	26
Mean	....	44	99	46	82	4.0	18	.31		....	18		....	55			....

*May.

NORTH ATLANTIC STORMS FOR JUNE, 1890 (pressure in inches and millimetres; wind-force by Beaufort scale).

The paths of the depressions that appeared over the north Atlantic ocean during June, 1890, are shown on chart i. These paths have been determined from international observations by captains of ocean steamships and sailing vessels received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

Ten depressions have been traced for the current month, four of which were continuations of areas of low pressure which first appeared over the North American continent, two developed over or near Newfoundland, one about midway between Newfoundland and the Azores, and three to the westward or northwestward of the British Isles. The depressions generally pursued normal east to northeast paths, and no storms traversed the ocean from coast to coast. Compared with the storms traced for June during the last seven years, the depressions noted for the current month, while exceeding in number the average for the period named, were deficient in energy, and gales of unusual strength were not encountered along the trans-Atlantic steamship routes.

The month opened with a depression central on the west coast of Newfoundland, where the pressure fell to about 29.55 (749), and a second depression was central northeast of the Grand Banks. During the 2d and 3d the depression first referred to moved slowly northeastward over Newfoundland, with an apparent slight increase in pressure, and by the 4th had advanced eastward over mid-ocean near the fiftieth parallel, after which it probably moved northeastward beyond the region of observation. During the 2d and 3d the pressure fell rapidly to the west of the British Isles, and on the latter-named date fresh to strong gales and pressure falling to about 29.40 (747), were reported off the Irish coast, and on the 4th a depression of considerable strength was central northwest of Ireland. From the 8th to 10th a depression which was a continuation of low area i moved from the Gulf of Saint Lawrence northeastward over Newfoundland, after which it apparently recurved to the southward and united with a depression which was central on the 11th south of Newfoundland. From the 9th to 11th fresh to strong gales prevailed east of the twenty-fifth meridian under the influence of a depression which first appeared east of the Grand Banks on the 4th, and moved thence northeastward north of the fifty-fifth parallel by the 9th, whence it passed southeastward to Ireland by the 11th, and thence eastward over the British Isles. From the 11th to 13th a depression advanced from south of Newfoundland east-northeast to mid-ocean, with pressure falling to or below 29.50 (749), and fresh to strong gales over mid-ocean on the latter-named date, after which it disappeared north of the region of observation. On the 15th a depression, which was probably a continuation of low area ii, was central on the south coast of Newfoundland, whence it moved east-northeast, and on the 17th was attended over mid-ocean by fresh to strong gales and pressure falling to about 29.40 (747), after which it disappeared north of the region of observation. From the 19th to the 21st a depression, which was a continuation of low area vi, moved east-northeast from south of Nova Scotia to the fiftieth parallel, attended by fresh to strong gales, after which it disappeared north of the region of observation. From the 25th to 29th fresh to strong gales and pressure varying from 29.50 (749) to 29.90 (754) attended the passage of low area viii which advanced from the Saint Lawrence Valley to the New England coast, thence eastward to Nova Scotia, over and south of which province it pursued an irregular course until the evening of the 28th, and thence northeastward over Newfoundland as depression number 9 during the 29th and 30th. On the 25th a depression was central south or southeast of Iceland, whence it moved eastward and disappeared north of the British Isles after the 26th. During the 29th and 30th a depression of considerable energy moved southeastward west of British Isles, and on the latter-named date was attended by pressure falling to about 29.40 (747) and fresh to strong gales.

Reports of the last seven years show that severe storms seldom occur in the tropical or sub-tropical regions of the north Atlantic ocean or over the Gulf of Mexico in June, and that in 1886 and 1889 only were depressions of marked strength

located in those regions. In 1886 three energetic storms traversed the Gulf of Mexico, the first of which moved north and northeast over the west Gulf during the 13th and 14th, attended by destructive gales along the west Gulf coast; from the 19th to 21st a depression moved from the western part of the Caribbean Sea northward over western Florida, attended by heavy rain in Cuba and dangerous gales over the eastern Gulf; and from the 27th to 30th a depression moved from the Caribbean Sea, near Jamaica, over northeastern Yucatan and thence recurved north and northeast over the Gulf to northern Florida, attended by severe gales and heavy rain. In 1889 a depression which originated over the western Caribbean sea moved northward between Cuba and Yucatan and recurved northeast over Florida from the 15th to 17th, accompanied by heavy rain and high winds. The most destructive storm noted for June over the western part of the north Atlantic ocean in recent years moved eastward from the New Jersey coast on June 5, 1885, and thence passed eastward to the Grand Banks by the 7th. This storm was considered the most disastrous that had visited the Newfoundland coast in forty years, and it was estimated that more than fifty vessels were totally wrecked, while a large number were driven ashore and more or less damaged.

OCEAN ICE IN JUNE.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for June, during the last eight years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
	° ′	° ′		° ′	° ′
June, 1883	40 28	51 45	June, 1883	48 14	42 43
June, 1884	40 42	47 49	June, 1884	44 00	45 23
June, 1885	39 38	48 12	June, 1885	45 14	41 12
June, 1886	40 30	53 00	June, 1886	49 15	40 00
June, 1887	40 40	48 34	June, 1887	43 22	39 19
June, 1888	43 38	43 24	June, 1888	43 38	43 24
June, 1889	42 54	49 54	June, 1889	46 57	40 29
June, 1890	40 01	52 00	June, 1890*	46 08	37 07

*On the 10th a small block of ice was reported in N. 46° 28′, W. 28° 34′.

The above table shows that for June, 1890, ice was reported about one and one-half degree south and nearly three and one-half degrees east of the average southern and eastern limits of Arctic ice for the corresponding month of the last seven years. The southernmost ice reported was a small iceberg on the 16th, and the easternmost ice reported was a medium-sized iceberg on the 3d, in the positions given. As shown by the note under the table a block of ice was reported about eight and one-half degrees farther east than the easternmost iceberg noted. In but one year, 1885, has ice been reported farther south, and the easternmost iceberg reported for the current month was more than two degrees farther east than the easternmost ice reported for June of preceding years, and in but one preceding year, 1887, has Arctic ice been reported east of the fortieth meridian. As regards quantity, the ice reported for the current month was largely in excess of the average for June of preceding years. From the 17th to the 20th a vessel effected the passage of the Straits of Belle Isle, and the captain reports that for thirty miles east of Belle Isle large icebergs and field ice were observed, and that thirty hours were required to make the passage from Cape Norman to Greenlet Island on account of the straits being blocked with ice. On the 29th numerous icebergs were reported from thirty miles east-northeast of Belle Isle to the Straits of Belle Isle, also a large patch of detached ice twelve miles east of Belle Isle; from Belle Isle to Point Amour there were numerous large icebergs thickly packed with small pieces of ice; and icebergs were observed one hundred and twenty-six miles from Point Amour on a course to Heath Point, Anticosti Island.

FOG IN JUNE.

The limits of fog belts west of the fortieth meridian are shown on chart i by dotted shading. In the vicinity of the Banks of Newfoundland fog was reported on sixteen dates; between the fifty-fifth and sixty-fifth meridians on fifteen dates; and west of the sixty-fifth meridian on nine dates. Compared with the corresponding month of the last two years the dates of occurrence of fog near the Grand Banks numbered five less than the average; between the fifty-fifth and sixty-fifth meridians the same as the average; and west of the sixty-fifth meridian seven less than the average. On all dates for which fog was reported near the Banks of Newfoundland it was noted in the eastern quadrants of areas of low pressure advancing from the westward. With the exception of the 4th and 5th, when falling barometer, threatening weather, and rain prevailed in that region, the fog reported between the fifty-fifth and sixty-fifth meridians attended the approach or passage to the northward of areas of low pressure. West of the sixty-fifth meridian fog occurred with the approach or passage of areas of low pressure, save on the 5th, when falling barometer and threatening weather prevailed in that region. The reports of Signal Service observers show that on the 4th dense fog prevailed on the Massachusetts coast with southeast wind and rain; on the 5th on the Connecticut and Rhode Island coasts with southeast wind and rain; on the 6th at New York City with a low pressure storm in the Saint Lawrence Valley; on the 7th and 12th on the Massachusetts, Rhode Island, and New York coasts with low pressure storms in the Saint Lawrence Valley; on the 13th, 14th, and 18th along the southern New England coast with low pressure storms in the Saint Lawrence Valley; on the 19th on the coast of eastern Maine with a low pressure storm over Nova Scotia; on the 24th from Maine to New Jersey with a low pressure storm in the Saint Lawrence Valley; and on the 25th on the coasts of Rhode Island and New York with a low pressure storm in the Saint Lawrence Valley.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for June, 1890, is exhibited on chart ii by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Signal Service represents the mean of the maximum and minimum temperatures.

For June, 1890, the mean temperature was highest over southwestern Arizona and the adjoining part of California, where it was above 85°, and the mean values were generally above 80° in the Atlantic coast states south of the thirty-fifth parallel, and south of a line traced irregularly westward over the Gulf States to the middle Rio Grande valley. The mean temperature was also above 80° from southwestern Arizona and southeastern California northward over southern Nevada. The mean temperature was lowest at the more elevated stations in west-central Colorado and in extreme northwestern Washington, where it was below 50°, and the mean readings were below 60° in the Canadian Maritime Provinces, Maine, extreme northern Michigan, northeastern Minnesota, from western Montana southeastward to south-central Colorado and southwestward to west-central Nevada, in central Nevada, and